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EXAMINER

AMINI, JAVID A

ART UNIT PAPER NUMBER

2672

DATE MAILED: 03/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/044,168

Applicant(s)

RISING ET AL.

Examiner

Javid A Amini

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on 22 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

***PROSECUTION IS HEREBY REOPENED***

In view of the Appeal Brief filed on December 22, 2004, PROSECUTION IS HEREBY REOPENED. New ground of rejection set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-27 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant in the preamble of the independent claims uses a term “graph rewriting”. Examiner’s comment: Graph is a drawing illustrating the relations between certain quantities. Applicant requires to explicitly specifying the meaning of the term “graph” corresponding to the term “rewriting”. Should it be written as “graph redrawing”? Does the term “multimedia content” contain an image, sound, video, text and etc.? What are the pre-defined templates and where are they stored?

What method of comparing does the Applicant use?

What does occur to “validating the input graph” if there is no match with a template graph?

Dose Applicant’s computerized method analyze the content of multimedia prior to storage or after?

Is the graph rewriting exactly similar to the multimedia content?

Does the comparing scenario identify all objects for multimedia content?

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-27 rejected under 35 U.S.C. 102(b) as being anticipated by Euripides G.M.

Petrakis, Member, IEEE, and Christos Faloutsos (hereafter refers as a “Euripides”).

Claim 1.

***Euripides discloses on page 435 under section 1, that shows a computerized method, quote from the reference: In medicine, in particular, a large number of images of various imaging modalities (e.g., computer tomography, magnetic resonance, etc.) are produced daily and used to support clinical decision making. A computerized method of graph rewriting, a graph having nodes representing entities and edges between the nodes representing relationships between entities, the method comprising: Euripides in figs. 1-2 illustrates graph rewriting of an image and its corresponding ARG (i.e. graph rewriting). Euripides on page 436 under section 2.1 discloses image descriptions are given in terms of object properties, and in terms of***

*relationships between objects. The textbook approach to capture this information is the Attributed Relational Graphs (ARGs). In an ARG, graph nodes represent the objects, and arcs between such nodes represent the relationships between objects. Both nodes and arcs are labeled by attributes corresponding to properties (features) of objects and relationships, respectively.*

As claim invention discloses that comparing an input graph representing a description scheme for multimedia content with a set of predefined template graphs. *Euripides on page 437 in first column and in fig. 2 discloses the specific features, which are used in ARGs, are derived from the raw image data and, depending on the application, can be geometric (i.e., independent of pixel values), statistical, or textural, or features specified in some transform domain (e.g., Fourier coefficients of object shapes). In the case of medical CT and MRI images used in this work, the set of features is given in Section 4.1. However, the proposed methodology is independent of any specific kind of features. The problem of retrieving images, which are similar to a given example, image is transformed into a problem of searching a database of stored ARGs: Given a query, its ARG has to be computed and compared with all stored ARGs. Matching between ARGs is a well-known problem and has been studied extensively in the computer vision literature. Specifically, matching a query and a stored graph is treated as a sub graph isomorphism problem.*

As claim invention discloses in the last line of claim one that validating the input graph when there is a match with a template graph. *Euripides on page 437 in second column discloses that the first term in Eq. (1) is the cost of matching (validating as the claim language specifies) associated nodes, while the second term is the cost of matching the relationships between such*

*nodes. In our setting, only a subset of the objects in the stored image  $S$  needs to be matched. There is no cost if the data image contains extra objects; however, we assume that the cost is infinite if the data image is missing one of the objects of the query.  $COST$  is the cost of matching features of objects or features of relationships between associated objects. The distance between images  $Q$  and  $S$  is defined as the minimum distance computed over all possible mappings  $F()$ : see Eqs. 2-4. Similarity searching in an IDB of stored ARGs requires that all images within distance  $t$  must be retrieved. Specifically, we have to retrieve all the images  $S$  that satisfy the Eq. 4 condition.*

Claim 2.

The computerized method of claim 1, wherein the comparing uses a graph matching process. *Euripides on page 436 under section 2.1 discloses image descriptions are given in terms of object properties, and in terms of relationships between objects. The textbook approach to capture this information is the Attributed Relational Graphs (ARGs). In an ARG, graph nodes represent the objects, and arcs between such nodes represent the relationships between objects. Both nodes and arcs are labeled by attributes corresponding to properties (features) of objects and relationships, respectively.*

Claim 3.

The computerized method of claim 2, wherein the comparing comprises: creating adjacency matrices representing the input graph and the set of template graphs. *Euripides on page 440 under section 4.1 and in second column teaches that additional features that could be used include the average gray-level and texture values, moments, or*

*Fourier coefficients, etc., as object descriptors; relative size, amount of overlap-ping, or adjacency, etc., can be also used to characterize the relationships between objects.*

Claim 4.

The computerized method of claim 1 further comprising: evaluating the input graph against a set of pre-defined alphabet graphs; and applying a rule associated with a matching alphabet graph to the input graph, the rule represented by a rule graph and a set of morphism graphs. *Euripides on page 437 in column one discloses matching a query and a stored graph is treated as a sub graph isomorphism problem. Examiner comment: the meaning of morphism is an abstraction of a function or mapping between two objects.*

Claim 5.

The computerized method of claim 4, wherein the evaluating uses a graph matching process. *This step is inherent in the reference see figs. 1-3 of the Euripides.*

Claim 6.

The computerized method of claim 5, wherein the evaluating comprises: creating adjacency matrices for the input graph and the set of alphabet graphs. *Euripides on page 439 in the first column discloses that the CAFIIR system proposes the “iconic index tree” to accelerate the search on facial images. One novelty of the system is that it can process “fuzzy” (i.e., subjective or in-complete) queries, through the so-called “fuzzification” technique, which translates the feature space to a fuzzy space. Also see page 440 the last paragraph before section 4.2 Euripides discloses set of alphabet graph or image translated or scaled with respect to each other.*

Claims 7 and 8.

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The computerized method of claim 4, wherein the applying comprises: performing pushout/pullback operations. *As Applicant on page 11 paragraph 0029 discloses that the two particular operations in algebraic graph grammars are suitable to build graph rewriting techniques for description scheme graphs: pushout and pullback. Pushouts and pullbacks can be thought of as sums and products, respectively. Euripides on page 437 in Eqs. 1 –4 clearly shows the meaning of sums and products. Also in fig. 1b illustrates the pullback (also called the fiber product) is the limit of a diagram consisting of at least two morphisms  $r_{23}: v_2 \rightarrow v_3$  and  $r_{12}: v_1 \rightarrow v_3$  with a common codomain (A set within which the values of a function lie (as opposed to the range, which is the set of values that the function actually takes). Explicitly, the pullback of the morphisms  $r_{23}$  and  $r_{12}$  consists of an object  $v_0$  and two morphisms  $r_{01}: v_0 \rightarrow v_1$  and  $r_{02}: v_0 \rightarrow v_3$  for which the diagram. The categorical dual of a pullback is a called a pushout.*

#### Claim 9.

The computerized method of claim 8, wherein performing the pullback operation comprises: creating adjacency matrices representing smallest portions of the set of morphism graphs that map the input and rule graphs to the alphabet graph using pre-images of parts of the alphabet graph marked for change; and multiplying the adjacency matrix associated with the input graph by a transpose of the adjacency matrix associated with the rule graph. *See rejection of claims 7-8 that applies to the rejection of this claim.*



Claim 10

See rejection of claim 1.

Claims 11-18

The rejections of claims 2-9 apply to the rejections of claims 11-18.

Claims 19-27

The rejections of claims 2-9 apply to the rejections of claims 19-27.

***Conclusion***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A Amini whose telephone number is 571-272-7654. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 571-272-7664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Javid A Amini  
Examiner  
Art Unit 2672

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PRIMARY EXAMINER